

The background of the entire slide is a space-themed illustration. On the left, a large, detailed Earth's moon is shown in shades of blue and white. To its upper left, the reddish-orange planet Mars is visible. A small rocket ship is positioned between the moon and the center, emitting a bright cyan beam of light that extends towards the right. The sky is a deep blue with numerous white stars. In the bottom right, the dark silhouette of a person's head and shoulders is shown in profile, looking towards the left. The bottom edge of the image shows a dark, silhouetted horizon line.

EXPLORESPACE TECH

TECHNOLOGY DRIVES EXPLORATION

LEAD Outcome 3

NASA's Space Technology Mission Directorate | Strategic Technology Framework | August 2023

STMD Strategic Framework

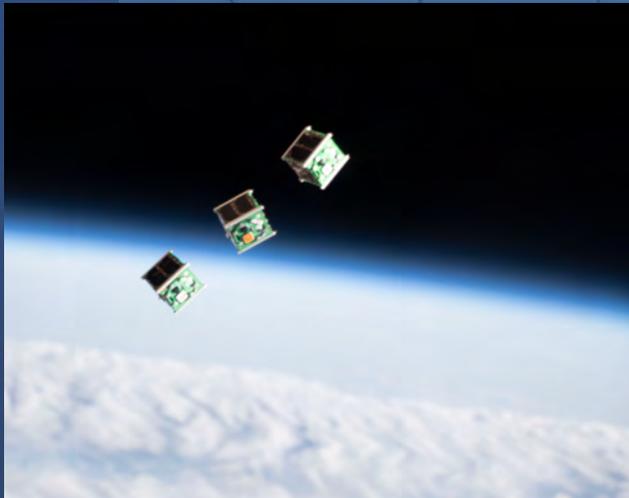
THRUSTS		OUTCOMES		CAPABILITIES
 <p>LEAD Ensuring American global leadership in space technology</p> <ul style="list-style-type: none"> • Advance US space technology innovation and competitiveness in a global context • Encourage technology driven economic growth with an emphasis on the expanding space economy • Inspire and develop a diverse and powerful US aerospace technology community 	 <p>GO Rapid, Safe, & Efficient Space Transportation</p>	<ul style="list-style-type: none"> • Develop nuclear technologies enabling fast in-space transits. • Develop cryogenic storage, transport, and fluid management technologies for surface and in-space applications. • Develop advanced propulsion technologies that enable future science/exploration missions. 	<ul style="list-style-type: none"> • Nuclear Systems • Cryogenic Fluid Management • Advanced Propulsion 	
	 <p>LAND Expanded Access to Diverse Surface Destinations</p>	<ul style="list-style-type: none"> • Enable Lunar/Mars global access with ~20t payloads to support human missions. • Enable science missions entering/transiting planetary atmospheres and landing on planetary bodies. • Develop technologies to land payloads within 50 meters accuracy and avoid landing hazards. 	<ul style="list-style-type: none"> • Entry, Descent, Landing, & Precision Landing 	
	 <p>LIVE Sustainable Living and Working Farther from Earth</p>	<ul style="list-style-type: none"> • Develop exploration technologies and enable a vibrant space economy with supporting utilities and commodities <ul style="list-style-type: none"> • Sustainable power sources and other surface utilities to enable continuous lunar and Mars surface operations. • Scalable ISRU production/utilization capabilities including sustainable commodities on the lunar & Mars surface. • Technologies that enable surviving the extreme lunar and Mars environments. • Autonomous excavation, construction & outfitting capabilities targeting landing pads/structures/habitable buildings utilizing in situ resources. • Enable long duration human exploration missions with Advanced Habitation System technologies. 	<ul style="list-style-type: none"> • Advanced Power • In-Situ Resource Utilization • Advanced Thermal • Advanced Materials, Structures, & Construction • Advanced Habitation Systems 	
	 <p>EXPLORE Transformative Missions and Discoveries</p>	<ul style="list-style-type: none"> • Develop next generation high performance computing, communications, and navigation. • Develop advanced robotics and spacecraft autonomy technologies to enable and augment science/exploration missions. • Develop technologies supporting emerging space industries, including: Satellite Servicing & Assembly, In Space/Surface Manufacturing, and Small Spacecraft technologies. • Develop vehicle platform technologies supporting new discoveries. • Develop technologies for science instrumentation supporting new discoveries. • Develop transformative technologies that enable future NASA or commercial missions and discoveries 	<ul style="list-style-type: none"> • Advanced Avionics Systems • Advanced Communications & Navigation • Advanced Robotics • Autonomous Systems • Satellite Servicing & Assembly • Advanced Manufacturing • Small Spacecraft • Rendezvous, Proximity Operations & Capture • Sensor & Instrumentation 	



LEAD

Ensuring American global leadership in space technology

Outcome 3: Inspire and develop a diverse and powerful U.S. aerospace technology community



Make it easier for all U.S. individuals and organizations to contribute to NASA technology development



Increase representation of diverse and non-traditional groups across STMD's portfolio to leverage creativity and innovation from across America



Cultivate a pipeline of technologists and innovators

Objective 1: Make it easier for all U.S. individuals and organizations to contribute to NASA technology development

STMD is a technical organization. Internal processes and requirements can introduce unnecessary complexity that gets passed on to potential collaborators during the pre-proposal and proposal process. STMD aims to reduce barriers within its control to benefit all collaborators.

Target Tactics

- ✓ Direct, targeted outreach
- ✓ TechPort funding opportunity search tool:
<https://techport.nasa.gov/opportunities>
- ✓ Diverse early-stage opportunities
- ✓ Varied award mechanisms
- ✓ Enhanced solicitation and proposal review processes*
 - Solicitation proof/review to reduce complexity
 - Step A/B proposals
 - Double anonymous peer review

Sample Metrics

- % of first-time STMD proposers
- % of first-time STMD awardees

* Processes may vary from solicitation to solicitation and are subject to change

The screenshot displays the TechPort website's 'Funding Opportunities' page. At the top, there is a navigation bar with links for Home, Taxonomy, Framework, About Us, and Help. A search bar is prominently featured, with a search button and an 'Advanced Search' link. Below the search bar, the page title 'Funding Opportunities' is displayed. The main content area is titled 'Interested in developing technology with NASA?' and includes a disclaimer. Below this, there are two filter sections: 'Your roles or organization:' with checkboxes for General Public / Innovator, Small Business, Large Business, Non-Profit or Research Institution, International, NASA, Undergraduate Student, Graduate Student, High School Student, Other Academic Researcher, and Minority-Serving Institution; and 'Funding Needed' with a slider set between \$0 and \$15,000,000. A 'Technology Maturity' filter is also present, set to TRL 1 - 9. A 'Clear all filters' button is visible. Below the filters, a table lists 'These opportunities might be a good fit for you:' with 27 results found. The table has columns for Funding Opportunity, Average Project Funding, Average Duration (Months), Frequency, Next Opportunity, Mission Directorate, and Topic-Specific or Open.

Funding Opportunity	Average Project Funding	Average Duration (Months)	Frequency	Next Opportunity	Mission Directorate	Topic-Specific or Open
Announcement of Collaboration Opportunity	\$1,000,000	24	Every 2-3 years	TBD	STMD	Topic
BIG Idea Challenge	\$180,000	9	Annual	2024/01	STMD	Topic
Centennial Challenges	\$500,000	36	Ongoing	Ongoing	STMD	Topic
Early Career Faculty	\$600,000	36	Annual	2024/02	STMD	Topic
Early Stage Innovations	\$650,000	36	Annual	2023/04	STMD	Topic

Objective 2: Increase representation of diverse and non-traditional groups across STMD's portfolio to leverage creativity and innovation from across America

One of NASA's core values is inclusion. Via LEAD outcome 3 and supporting activities, STMD aims to drive transformative technology development anchored in creativity and innovation. This requires innovative means of engaging and nurturing non-traditional communities, opening doors to new opportunities, and supporting diverse ideas from diverse sources.

Target Tactics

- ✓ Targeted outreach
- ✓ Planning and capacity building grants
- ✓ Partnering with the Office of STEM Engagement's [Minority University Research and Education Project](#)
- ✓ [NASA Innovation Corps \(I-Corps\)](#)
- ✓ [Technology Transfer Expansion](#) Tech Center Research Park Accelerator Network

Sample Metrics

- # of transitions from developmental solicitations to other opportunities
- % of proposals from Minority-Serving Institutions that are selected/awarded

Objective 3: Cultivate a pipeline of technologists and innovators

U.S. industries that rely on a technologically skilled workforce are facing labor shortages that are projected to continue (U.S. Chamber of Commerce Foundation, 2022). STMD supports a strategy to build up the pipeline of people capable of contributing to current and future space technology research, development, and demonstration.

Target Tactics

- ✓ Execute opportunities that attract, grow, and retain NASA workforce talent
- ✓ Foster internal collaboration
- ✓ Foster external talent within universities and small businesses
- ✓ Offer active STEM learning experiences
- ✓ Pursue high-impact STEM engagement projects and partnerships
- ✓ Strategic communications, outreach, and STEM engagement across all programs

Sample Metrics

- # of interns and early career professionals supporting STMD projects
- STMD employee retention rate
- Estimate number of students engaged

